REMARKS

I. Introduction

Applicants would like to thank Examiner Hughes for the indication of allowable subject matter recited in claims 2, 4, 9-13, 15, 17 and 22-28.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

II. The Rejection Of The Claims Under 35 U.S.C. § 102

Claims 14, 16 and 18-21 are rejected under 35 U.S.C. § 102 as being anticipated by USP No. 5,812,710 to Sugaya. Applicants respectfully traverse this rejection for at least the following reasons.

Claim 14 recites in-part an optical amplification method, comprising the steps of: 1) guiding the multiplexed signal light channels to an optical filter capable of changing a gradient $dL/d\lambda$ of a loss L (dB) with respect to a wavelength λ (nm) in the predetermined wavelength band, and 2) controlling the gradient $dL/d\lambda$ of the optical filter so as to flatten the wavelength dependence of light power obtained by the optical amplifying method, and 3) controlling an intensity of the optical pumping light to keep the total power of multiplexed signal light obtained by the optical amplifying method at predetermined level.

In accordance with the present invention, the gradient $S(\lambda)$ of the optical filter is controlled by the control circuit such that the loss becomes smaller as the wavelength becomes longer, where the wavelength dependence of gain of the input-side optical amplification section and the output-side optical amplification section is canceled by the loss spectrum of the optical filter. As a result, the gain characteristic of the optical amplifier becomes almost constant

independent of the wavelength while maintaining the gain flatness (see, e.g. page 28, lines 6-22 of the specification).

In the pending Office Action, the Examiner asserts that Sugaya discloses, at col. 20, guiding the multi-wavelength light to the optical level adjusting unit capable of changing a gradient with respect to a wavelength in the predetermined wavelength band (see, page 2 of Office Action).

However, at a minimum, Sugaya does not disclose or suggest controlling the **gradient dL/dλ** of the optical filter so as to **flatten the wavelength dependence** of light power. The Examiner has not identified or addressed *how* the wavelength dependence is flatten by changing any parameter of the optical level adjusting unit (alleged optical filter). Indeed, the Examiner admits, at page 4, lines 5-7 of the Office Action, that Sugaya only discloses one or a plurality of optical amplification sections and optical pumping light sources, but does not disclose or suggest guiding the multiplexed signal light channels to an optical filter capable of controlling the gradient dL/dλ of the optical filter so as to flatten the wavelength dependence of light power, as recited in claim 14.

As anticipation under 35 U.S.C. § 102 requires that each element of the claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference, *Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983)*, and at a minimum, Sugaya fails to disclose the foregoing claim elements, it is clear that Sugaya does not anticipate claim 14 or any of the claims dependent thereon.

III. The Rejection Of The Claims Under 35 U.S.C. § 103

Claims 1, 3, 5-8 and 29-31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugaya. Applicants respectfully traverse this rejection for at least the following reasons.

The Applied Prior Art Does Not Disclose All Claim Elements

Claims 1 and 29 recite in-part an optical filter capable of changing a gradient $dL/d\lambda$ of a loss L with respect to a wavelength λ in the predetermined wavelength band in response to a change of the gain wavelength dependence in the optical amplification section(s), and control means for controlling each optical pumping light output from said optical pumping light sources so as to keep the total power of light output from said optical amplifier at predetermined level and controlling the gradient $dL/d\lambda$ of said optical filter so as to flatten the wavelength dependence of light power output from said optical amplifier. Claim 31 recites in-part guiding the multiplexed signal light components to an optical filter capable of changing a gradient $dL/d\lambda$ of a loss L with respect to a wavelength λ in the predetermined wavelength band and controlling the gradient $dL/d\lambda$ of the optical filter so as to flatten the wavelength dependence of light power obtained by said optical amplifying method.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the ***claimed invention*** where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *Ecolochem Inc. v. Southern California Edison Co., 227 F.3rd 1361, 56 U.S.P.Q.2d (BNA) 1065 (Fed. Cir. 2000); In re Dembiczak, 175 F.3d 994, 999, 50 U.S.P.Q.2D (BNA) 1614, 1617 (Fed. Cir. 1999); In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992).* See also **M.P.E.P § 2143.01**.

The Examiner asserts that the attenuator of Sugaya corresponds to the claimed optical filter. However, Sugaya discloses that the attenuation of the variable optical attenuator keeps the multi-wavelength light **output** from the optical amplifying unit at **a constant level** (see, col. 15, lines 51-55 and col. 19, lines 31-34). As such, the attenuator of Sugaya is fundamentally different from that of the present invention because the attenuator of Sugaya is capable of controlling the total optical level of the output light, but is incapable of **equalizing each optical level of each light** in the multi-wavelength light.

Furthermore, the Examiner asserts that Sugaya discloses a variable optical attenuator capable of changing a gradient with respect to a wavelength in the C-band, and admits that Sugaya does not disclose or suggest a control means for controlling the gradient $dL/d\lambda$ of the variable optical attenuator so as to flatten the wavelength dependence of the light power output from the optical amplifier, but alleges that Sugaya discloses a control unit 4 that controls both the pump light sources 3 and optical level adjusting unit 301 (see, page 4 of Office Action).

In contrast, Sugaya discloses that the optical gain of the optical fiber amplifying unit 2 depends on the wavelength, where the wavelength characteristic relating to the optical gain depends on the **optical level of the excitation light** and the **optical level of the optical input signal** to the optical fiber amplifying unit 2 (see, col. 4, lines 43-51). In other words, Sugaya specifically discloses controlling these two optical levels so as to equalize the output signal level in relation to the wavelength, and to maintain a constant output optical level (see, col. 4, lines 48-51). As such, at a minimum, nowhere does Sugaya disclose or suggest that the variable optical attenuator (alleged optical filter) is capable of changing a gradient $dL/d\lambda$ of a loss L with respect to a wavelength λ in response to a change of the gain wavelength dependence, or a control means

for controlling the gradient dL/dλ of the variable optical attenuator so as to flatten the wavelength dependence of light power output.

Indeed, contrary to the conclusion set forth in the pending rejection, as readily shown in Fig. 3, Sugaya discloses that the gain slope dG/dλ of the optical fiber amplifier is monitored by the excitation ratio via controlling the optical level of the excitation light. Thus, Sugaya is silent controlling the gradient of, if any, an optical filter as asserted by the Examiner so as to flatten the **wavelength dependence**. It does not appear that Sugaya discloses flattening any wavelength dependence. The Examiner has neither identified which element of Sugaya corresponds to the claimed equation dL/dλ for specifying the gradient, nor has the Examiner addressed ***how*** the gradient is changed ***in response to*** a change of the **gain wavelength dependence**.

It should be recognized that the fact that the prior art could be modified so as to result in the combination defined by the claims at bar would not have made the modification obvious unless the prior art suggests the desirability of the modification. *In re Deminski, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986).*

Moreover, recognizing after the fact that such a modification would provide an improvement or advantage, without suggestion thereof by the prior art, rather than dictating a conclusion of obviousness, is an indication of improper application of hindsight considerations. Simplicity and hindsight are not proper criteria for resolving obviousness. *In re Warner, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967).*

It is only Applicants' disclosure that discloses the foregoing claimed optical amplifier comprising an optical filter and control means. Neither does Sugaya nor any of the cited prior art disclose or suggest such an optical amplifier. Thus, the only motivation of record for the proposed modification of the optical equalization and amplification apparatus and method of

Sugaya to arrive at the claimed invention is found in Applicants' disclosure which, of course, may not properly be relied upon to support the ultimate legal conclusion of obviousness under 35 U.S.C. § 103. *Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 2271 USPQ2d 1593 (Fed. Cir. 1987).*

Thus, as each and every limitation must be either disclosed or suggested by the cited prior art in order to establish a *prima facie* case of obviousness (see, **M.P.E.P. § 2143.03**), and Sugaya fails to do so, it is respectfully submitted that claims, 1, 29 and 31 are patentable over the prior art.

There Is No Motivation To Make The Proposed Combination Of Prior Art

In order to establish the requisite motivation, the Examiner must point to a **source** in the applied prior art for **each** claim limitation and a **source** in the applied prior art for the requisite **motivational** element. *Smiths Industries Medical System v. Vital Signs Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999). More to the point, the Examiner is required to make a "thorough and searching" factual inquiry and, based upon that factual inquiry, explain **why** one having ordinary skill in the art would been realistically impelled to modify particular prior art, in this case the control means of Sugaya to arrive at the claimed invention. *In re Lee*, 237 F.3d 1338, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). Such a factual inquiry requires clear and particular factual findings as to a specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to modify the particular control means of Sugaya to arrive at the claimed invention. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); *Ecolochem Inc. v. Southern California Edison, Co.*, 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); *In re Kotzab*, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); *In re*

Dembiczak, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). **Merely identifying wherein features of a claimed invention are perceived to reside in disparate references does not establish the requisite motivation**. *In re Kotzab, supra*; *Grain Processing Corp. v. American-Maize Products Co.*, 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988). Rather, a **specific reason** must be offered based upon **facts** to support the asserted motivation- not **generalizations**. *Ecolochem Inc. v. Southern California Edison, Co. supra*; *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

In applying the above legal tenets to the exigencies of this case, Applicants submit that the requisite motivation element has **not** been established. Specifically, the Examiner has not actually explained **why** based on **facts**, one having ordinary skill in the art would somehow have proceeded **against** the specific teachings of Sugaya by modifying the control means.

In particular, Sugaya discloses three light sources 124/125/126 for providing excitation light to the optical fibers 121/122/123, under the control of the CPU control circuit 127. In this regard, Applicants note that Sugaya discloses that the CPU control circuit 127 controls the light intensity of the excitation light generated by the light sources 124/125/126 based on the optical level of each channel detected by the photodiodes 113-1 to 133-n (see, col. 18, lines 37-41). Thus, Sugaya specifically discloses providing a plurality of doped optical fibers having different amplification characteristics for respective wavelengths and individually controls the excitation light input to the doped optical fibers so as to perform a higher-precision gain balance control (see, col. 18, lines 16-21).

The Examiner asserts that Sugaya, in Fig. 23, does not specifically disclose or suggest that the control means 127 controls the gradient $dL/d\lambda$ of the optical filter so as to flatten the wavelength dependence of light power, but alleges that Sugaya, in Fig. 27A, teaches a control

unit 4 that controls both the pump light sources 3 and the optical level adjusting unit 301, where the attenuator imparts loss to control the optical power level.

The Examiner is directed to **M.P.E.P § 2143.01** under the headings "THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE" and "THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE" which set forth the applicable standard:

> If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).
>
> If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

In the instant case, it is respectfully submitted that the proposed modification of Sugaya would both render Sugaya inoperable for its intended purpose and change the principle of operation of Inagaki. That is, the intended purpose of Sugaya is to provide **an ALC circuit 25** for controlling the attenuation of **variable optical attenuator 11** such that the optical signal level can be set to a constant value determined by the reference voltage (see, col. 15, lines 6-11), and to supply **a CPU control circuit 127** for decreasing the intensity of excitation light of the **light source 126** so as to decrease the dependency on the doped optical fiber 123 (see, col. 19, lines 20-23). Thus, modifying Sugaya in the manner asserted by the Examiner to use a single control unit 4 to control the attenuator and the pump light source would completely nullify the intended purpose of utilizing the ALC circuit and the CPU control circuit of Sugaya.

Even assuming *arguendo* that the modification of Sugaya is proper, the Examiner's alleged motivation "for the advantage of modularity" is not pertinent to Sugaya. Indeed,

nowhere does Sugaya disclose or suggest **any lack of modularity** in the manner asserted by the Examiner. It does not appear that the foregoing alleged motivation is found or suggested in Sugaya.

Furthermore, the Examiner asserts that it would have been obvious to one of ordinary skill in the art to use a single control unit to control both the pump power source and the attenuator. However, the present invention does **NOT** utilize any attenuator. Hence, the optical amplifier of Sugaya is fundamentally different from that of the present invention.

Thus, for at least these reasons, it is respectfully submitted that claims 1, 29 and 31 are patentably distinct from the cited prior art.

IV. All Dependent Claims Are Allowable Because The Independent Claims From Which They Depend Are Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co., 819 F.2d at 1100, 1108 (Fed. Cir. 1987).* Accordingly, as claims 1, 14, 29 and 31 are patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also in condition for allowance.

For all of the foregoing reasons, it is submitted that claims 3, 5-8, 16, 18-21 and 30 are patentable over the cited prior art. Accordingly, it is respectfully submitted that the rejections of claims 14, 16 and 18-21 under 35 U.S.C. § 102, and claims 1, 3, 5-8 and 29-31 under 35 U.S.C. § 103 have been overcome.

Conclusion

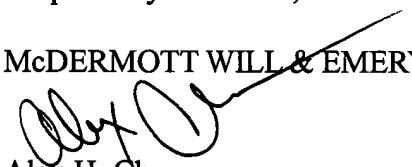
Accordingly, it is urged that the application is in condition for allowance, an indication of which is respectfully solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Alex H. Chan
Registration No. 52,713

600 13th Street, N.W.
Washington, DC 20005-3096
202.756.8000 AHC/jrj
Facsimile: 202.756.8087
Date: October 12, 2004